

REMARKS

Applicant respectfully requests reconsideration of the present application in view of the reasons that follow.

Claim Rejections Under 35 USC 103

Claims 1, 3-8, 11-13 and 15-20 and 23-27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kobayashi (U.S. Patent No. 6,632,776) in view of Snitchler (U.S. Patent No. 6,393,690). These rejections are respectfully traversed.

Independent claims 1, and 13 recite, a method of manufacturing an oxide superconducting wire, that includes pressurization that is started from a temperature reducing 0.2% yield strength of said metal below said total pressure in said heat treatment at a heat-up time before the heat treatment in said heat treatment step; and the speed of said pressurization is at least 0.05 MPa/min. The references of record fail to teach, suggest or render predictable a method as claimed including at least the above recited features of claims 1 and 13.

Kobayashi teaches away from pressurization that is started from a temperature reducing 0.2% yield strength of said metal below said total pressure in said heat treatment at a heat-up time before the heat treatment in said heat treatment step. More specifically, Kobayashi teaches, “the pressurized atmosphere is preferably kept at least 0.5 MPa from beginning to end of the heat treatment in the step of heat treating the wire.” (Underline added for emphasis) (Column 2, lines 13-15) Therefore, Kobayashi does not teach pressurization that is started from a temperature reducing 0.2% yield strength.

The Examiner acknowledges that, “Kobayashi does not teach the requirements of starting pressurization from a temperature reducing the 0.2% yield strength...as required by claims 1 and 13.” (Office Action dated 12/17/2009; page 4, paragraph no. 5) The Examiner cites Snitchler as teaching the above recited features. (Paragraph No. 6) In particular, the Examiner asserts that,

Snitchler teaches a process of manufacturing a multifilamentary superconducting wire (abstract). Each filament may be covered

with insulating layers, which can be a variety of ceramic materials, then bundled inside of a silver jacket, as required by claim 8 (col. 16, lines 39-65). The wire can be twisted before a heat treatment, as required by claim 6 (col. 16, lines 30-35). An example of Snitchler teaches ramping up the temperature to 450 C at 10 C/minute and then to 500 C at 2 C/minute and given a high pressure oxidation treatment at 500 C and 100 atm, which is roughly 10 MPa, as required by claims 1,6, 11, 13 and 19 (col. 15, lines 57-60). (Paragraph 6)

However, Snitchler does not achieve 0.2% yield strength because Snitchler teaches high pressure oxidation treatment at 500°C at about 10 MPa. As disclosed in the Original Specification, 0.2% yield strength is realized with a combination of pressure and temperature. (Original Specification, page 25, lines 1-8.) For example, referring to Fig. 13, the 0.2 yield strength of silver is about 370 MPa when the atmosphere is at room temperature. (Original Specification, page 25, lines 3-5.) Also, 0.2% yield strength may be realized at 50 MPa when the temperature reaches 400°C, and the 0.2% yield strength is reduced to about 25 MPa when the temperature of the atmosphere reaches 600°C. (Original Specification, page 25, lines 5-8.)

As shown in the graph in Fig. 13 of the Original Specification 0.2% yield strength at 10 MPa requires significantly higher temperatures than 600 °C. (Original Specification, page 25, lines 5-8.) As noted above, Snitchler does not achieve 0.2% yield strength because Snitchler teaches high pressure oxidation treatment at 500°C at about 10 MPa. Therefore, Snitchler fails to teach or suggest the above recited features of claims 1 and 13.

The Examiner acknowledges that “Kobayashi in view of Snitchler does not teach starting pressurization from a temperature reducing the 0.2% yield strength.” (Office Action dated 12/17/2009, pages 4-5, paragraph no. 7.) Nonetheless, the Examiner states that “it is inherent that a starting temperature of 400-800 degree Celsius is the temperature reducing 0.2% yield strength of silver.” (Office Action dated 12/17/2009, page 5, lines 1-3.) The Examiner asserts:

It would have been obvious to a person ordinarily skilled in the art at the time of the invention to combine the teachings of forming an oxide superconducting wire by heat treating the

wire in a pressurized atmosphere with starting pressurization from a temperature between 400 to 800 degrees Celsius, as required by claims 1, 13. One would have been motivated to make this modification because Snitchler shows that a higher temperature and lower pressure provide quicker oxidation of the superconducting oxide material, which is an improvement over a high temperature and high pressure application in Figure 3 of Snitchler, which is similar to the process taught by Kobayashi. (Office Action dated 12/17/2009, paragraph 8)

The references of record fail to teach or suggest, pressurization is started at 0.2% yield strength. Snitchler teaches a 100% oxygen atmosphere for high pressure oxidation at 500 C and 10 MPa. (Col. 15, lines 49-67) However, claims 1 and 13 recite pressurization is started at 0.2% yield strength. As discussed above Snitchler fails to achieve 0.2% yield strength prior to initiating oxygen pressurization. There is no suggestion or motivation provided in the references of record to begin pressurization at 0.2% yield strength. One of ordinary skill in the art would not be motivated by the teachings of Kobayashi and Snitchler, alone or in combination, to start pressurizing at 0.2% yield strength.

Therefore, claims 1 and 13 are believed to be allowable. Because claims 3-10, 15, 23, 25-27 depended from claim 1, they are believed to be allowable for at least the same reasons claim 1 is believed to be allowable. Because claims 16-18 depend from claim 13, they are believed to be allowable for at least the same reasons claim 13 is believed to be allowable.

Claims 11 and 19 recite, a method of manufacturing or modifying an oxide superconducting wire, that includes the speed of said pressurization is at least 0.05 MPa/min. The references of record fail to teach or suggest at least the above recited features of claims 11 and 19.

In particular, Kobayashi teaches, “the total pressure of the pressurized atmosphere is kept at 0.5 MPa in the starting point of the heat treatment within the temperature region of less than 100 °C as well as in the end point of the heat treatment reaching the temperature region below the heat treatment temperature.” (Column 5, lines 15-21) Kobayashi fails to teach increasing the pressurization at any rate, i.e. 0.5 MPa/min. Instead, Kobayashi teaches maintaining a particular pressure, i.e. at least 0.5 MPa. Moreover, Kobayashi teaches

pressurizing atmosphere in the range of 0.1 MPa to 20 MPa, where the pressure is held at a particular value for 50 hours. (See e.g. Kobayashi et al., Table 1) Moreover, the pressure referred to in Kobayashi is the pressure during the heat treatment whereas the present claims refer to the speed of pressurization during heat up time before the heat treatment. Therefore, Kobayashi fails to teach or suggest at least the above recited features of claims 11 and 19.

Snitchler fails to teach or suggest at least the above recited features of claims 11 and 19. Instead, Snitchler discloses a high pressure oxidation treatment at 500 °C for 20 hours at 100 atm. (Column 15 lines 55-62) Snitchler disclose maintaining the pressure of the atmosphere at 100 atm for 20 hours. Snitchler does not teach increasing the pressure at the speed of at least 0.5 MPa/minute after the metal achieves a 0.2 % yield strength or pressurizing before the heat treatment. Therefore, Snitchler does not address the above noted distinctions between the present claims and Kobayashi. Accordingly, the Examiner's proposed combination of Kobayashi and Snitchler fails to teach at least the above recited features of claims 11 and 19.

Therefore, claims 1, 11, 13 and 19 are believed to be allowable. Because claims 3-10, 23 and 24 depend from claim 1, they are believed to be allowable for at least the same reasons claim 1 is believed to be allowable. Because claim 12 depends from claim 11, it is believed to be allowable at least the same reasons claim 11 is believed to be allowable. Because claims 15, 16, 17 and 18 depend from claim 13, they are believed to be allowable for at least the same reasons claim 13 is believed to be allowable. Because claim 20 depends from claim 19, it is believed to be allowable at least the same reasons claim 20 is believed to be allowable.

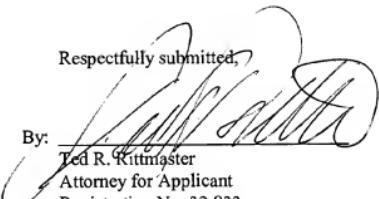
Concluding Remarks

Claims 1, 3, 4-13, 15-19 and 23-27 are pending in this application.

Applicant believes that the present application is in condition for allowance. Favorable reconsideration of the application as amended is respectfully requested. The Examiner is invited to contact the undersigned by telephone if it is felt that a telephone interview would advance the prosecution of the present application.

The Commissioner is hereby authorized to charge any additional fees which may be required regarding this application under 37 C.F.R. §§ 1.16-1.17, or credit any overpayment, to Deposit Account No. 19-0741. Should no proper payment be enclosed herewith, as by the credit card payment instructions in EFS-Web being incorrect or absent, resulting in a rejected or incorrect credit card transaction, the Commissioner is authorized to charge the unpaid amount to Deposit Account No. 19-0741. If any extensions of time are needed for timely acceptance of papers submitted herewith, Applicant hereby petitions for such extension under 37 C.F.R. §1.136 and authorizes payment of any such extensions fees to Deposit Account No. 19-0741.

Respectfully submitted,

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